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ONTARIO ENERGY FACTS

Coal in Ontario

Today

Of the forms of energy used in Ontario today, the best known are oil, natural gas and electricity. Because coal is rarely used by residential consumers, it tends to be overlooked.

Nevertheless, it is a vital component of Ontario's energy mix and economy. In 1983, coal represented about 13 per cent of Ontario's primary energy consumption, roughly on a par with nuclear energy and hydro power.

The two major consumers of coal in Ontario are Ontario Hydro and the steel industry. In 1983, Ontario Hydro used 10.3 million tonnes to produce electrical power, and the steel industry used 5.5 million tonnes. General industrial users accounted for another 0.7 million tonnes of total coal consumption.

Sources of Supply

At the present time, Ontario produces none of its own coal. However, the province does have deposits of lignite (a low-grade coal) at Onakawana in the James Bay Lowlands. This source is estimated to contain 170 million tonnes. Additional lignite reserves with potential for recovery have been identified in the same area by the Ontario Energy Corporation.

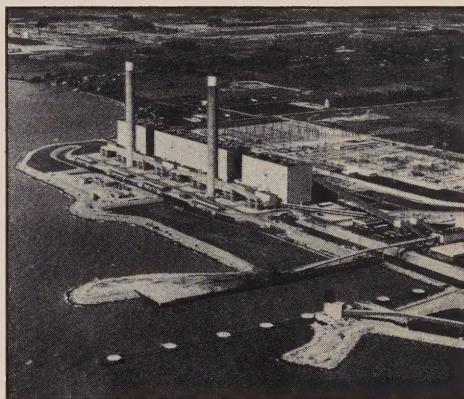
However, Onakawana lignite contains about 50 per cent moisture when mined, and its heating value is about 70 per cent that of Appalachian coal. These factors, combined with remoteness of location, mean that mining this source is not economically feasible at the present time.

Approximately 82 per cent of all the coal used in Ontario is imported from the Appalachian region of the United States, via the Great Lakes. The remainder comes from western Canadian mines by train to Thunder Bay. The majority of this is trans-

shipped to southern Ontario by lake freighter while some is used in north-western Ontario. Currently, coal imported to Ontario from the United States is able to undercut the prices of most competitive fuels, particularly where lake transportation is available.

Ontario Hydro

Ontario Hydro has seven coal-burning generating stations. These are Hearn, Keith, Lambton, Nanticoke, Lakeview, Thunder Bay and Atikokan.



Electrical Generating Plant This shows Nanticoke Generating Station on Lake Erie.

At Hydro's largest coal-burning station, Nanticoke on Lake Erie, western Canadian coal (which has a low sulphur content) is blended with higher-sulphur American coal. This blending reduces acid gas emissions which contribute to acid rain. Nanti-



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coke is the only Hydro station that has a coal blending capability. Ontario Hydro's other coal-fired stations could not use the lower sulphur, higher ash western Canadian coal without expensive modifications to meet atmospheric emission requirements or construction of blending facilities.

Thermal power generation from coal is more expensive than from nuclear fuel per unit of delivered energy, and coal generating stations are being displaced by Hydro's nuclear stations. Coal plants are now used either to meet peak power demands or when nuclear stations are shut down for maintenance. Hydro's coal consumption is expected to decrease yearly throughout the 1980s as new nuclear-powered stations come on stream and older, less efficient, coal-fired units are phased out. The Ministry of Energy forecasts that, in 1990, 11 per cent of the electricity consumed in Ontario will be generated from coal, 31 per cent from hydraulic energy and 57 per cent from nuclear power.

These three types of generation will thus continue to provide flexibility in power supply.

The Ontario Steel Industry

The plants of Stelco, Dofasco and Algoma Steel, the three major steel companies in Ontario, are located along the shores of the Great Lakes. In 1983, all their stocks of metallurgical grade coal (suitable for coke-making) were shipped from the United States in lake freighters.

Demand for coal in the steel industry fluctuates with the demand for steel, although as the steel industry has become more efficient it has come to use less coal per tonne of steel produced.

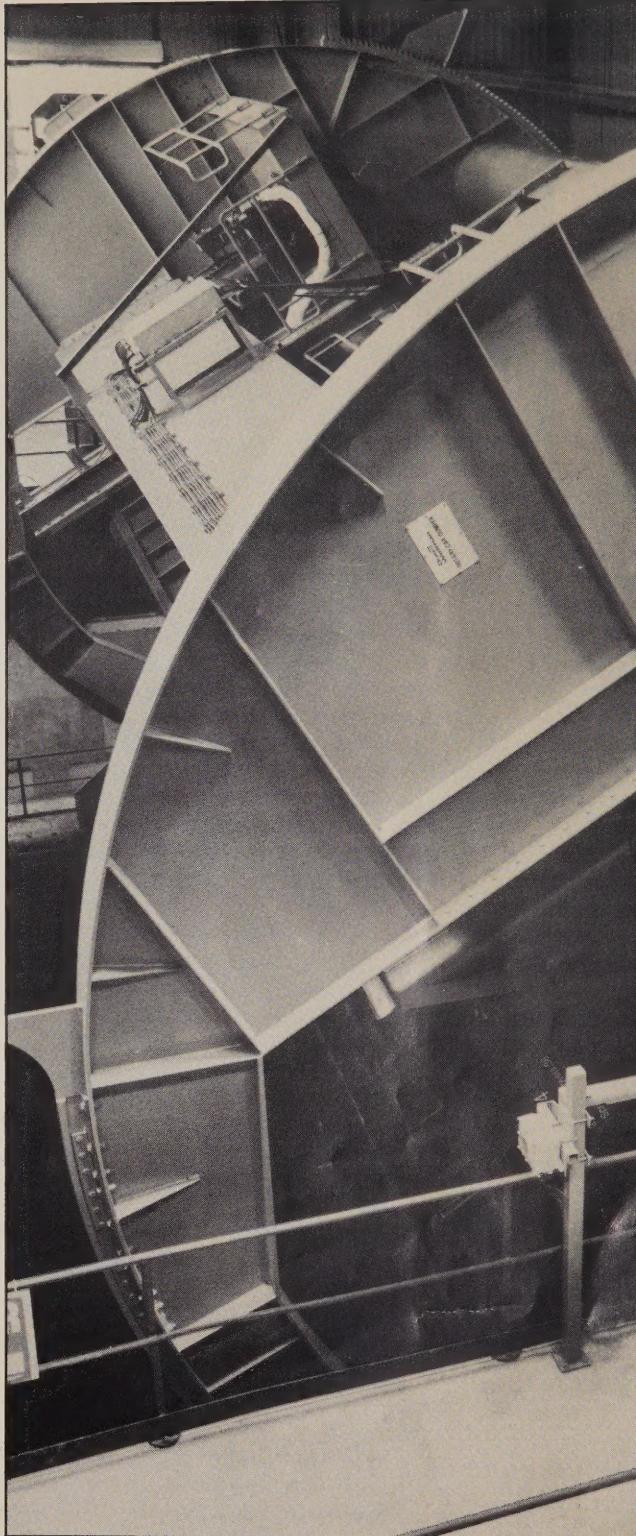
Other Sectors

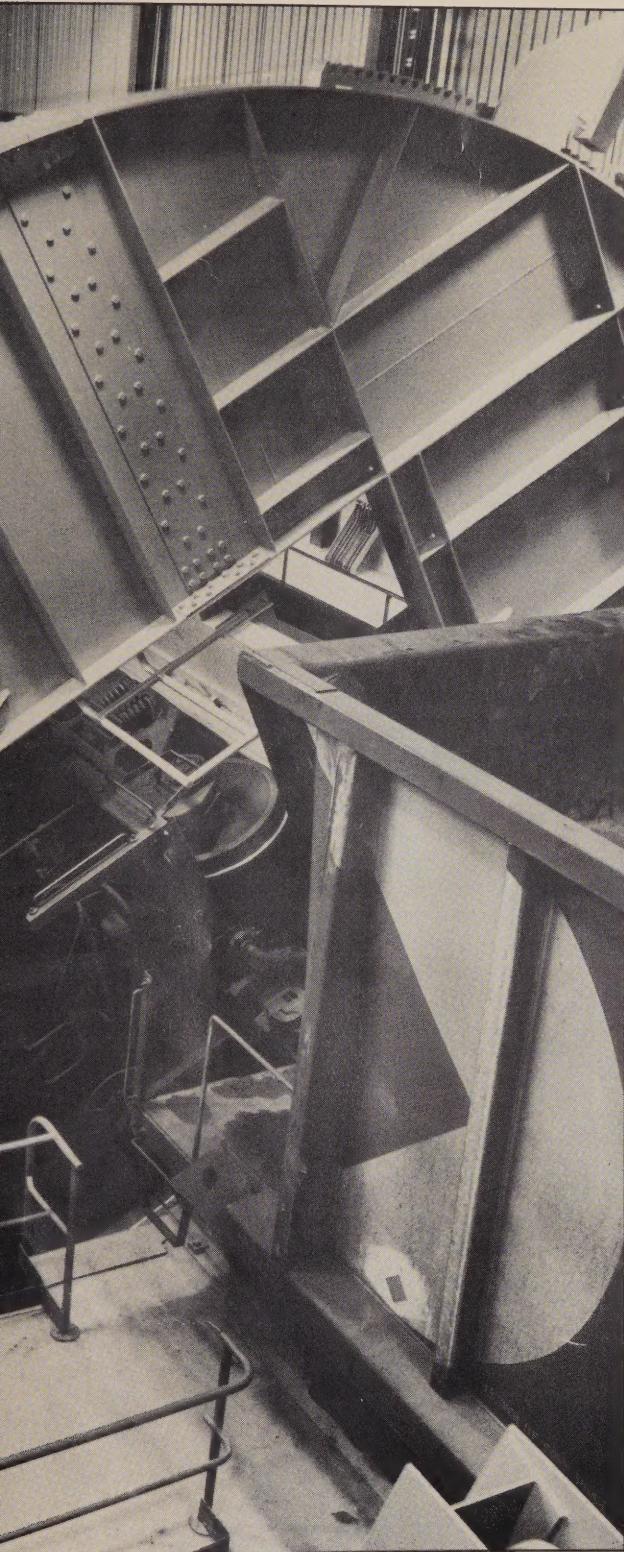
Just under 0.7 million tonnes per year – nearly 4 per cent of total Ontario coal consumption – is purchased for general industrial and commercial uses. The majority of this comes from the eastern United States.

The largest part of this supply is used by cement manufacturers, and most of the rest by the pulp and paper industry.

Coal And The Environment

Oxides of nitrogen (NO_x) and sulphur (SO_x) are coal combustion products which chemically react in the atmosphere to cause





"acid rain". Because of the environmental harm caused by acid rain, research on mitigative measures is under way.

As a large acid gas emitter, Ontario Hydro is under a control order to reduce its acid gas emissions by 1990. All coal is physically washed at the mine to reduce sulphur and ash levels. Low-nitrogen-oxide burners are being installed in some large coal-fired boilers to reduce their emissions.

Outlook

To develop more effective utilization of coal, Canadian researchers are investigating various aspects of coal combustion. Coal/liquid mixtures, such as coal/water or coal/oil, are being developed for use in existing oil-fired installations such as generating stations. The purpose of these mixtures is to continue to use the existing oil-based systems but to replace oil with coal either partially or entirely.

Ontario Hydro will be installing a prototype dry limestone injection scrubbing system on one 300 MW generating unit at Lakeview generating station along with state-of-the-art nitrogen oxide burners. It is hoped that this system will result in significant reductions in the emissions of the main ingredients of acid rain.

An experimental fluidized bed combustion system, able to reduce acid gas emissions by 90 per cent, is being developed in Prince Edward Island. When this process becomes commercially viable, it will allow the burning of higher-sulphur coal using a limestone bed to capture the sulphur dioxide without the need to install costly scrubbing devices.

Possible uses for Ontario lignite include its conversion into liquid fuel. Through "direct" and "indirect" liquefaction techniques, lignite can be transformed into such fuels as high-grade liquid crude or methanol. These synthetic fuels could replace some of our present oil-based liquid fuels.

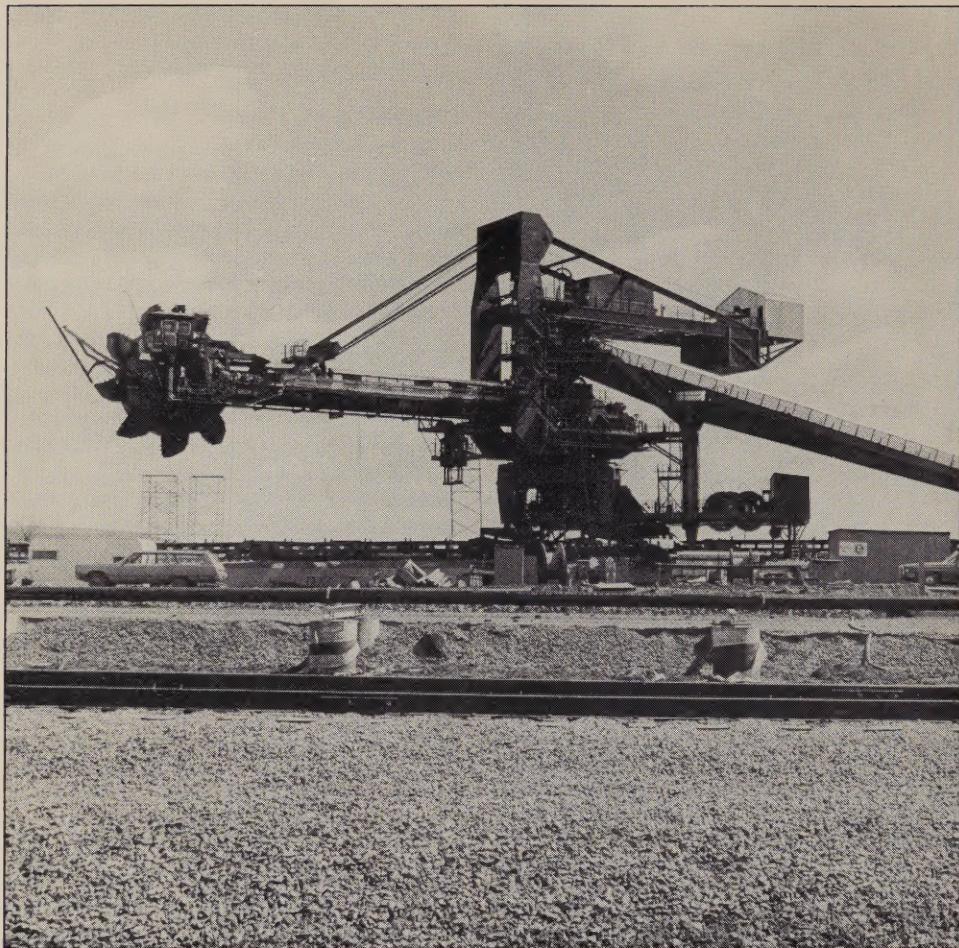
Demonstration projects for coal liquefaction are under way abroad, but commercial production of coal liquids in Canada is still some distance in the future.

Steel companies have been investigating alternative production processes that would

Rotary Car Dumper This equipment is used to rapidly unload coal trains without uncoupling the cars.

lower the amount of coke needed to produce steel. At the same time Ontario steel producers forecast small incremental growth in steel demand throughout the 1980s. Overall, consumption of metallurgical coal is expected to grow slowly.

Coal is a vital component of our energy balance. Much of the environmental damage that the use of coal has caused in earlier applications can be prevented by modern technology. As a result, coal represents a secure long-term energy source for Ontario.



Coal Stacker/Reclaimer This equipment is used to stockpile coal for storage when stacking or used to reclaim the coal for use in the power station when required.

For Additional Information

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